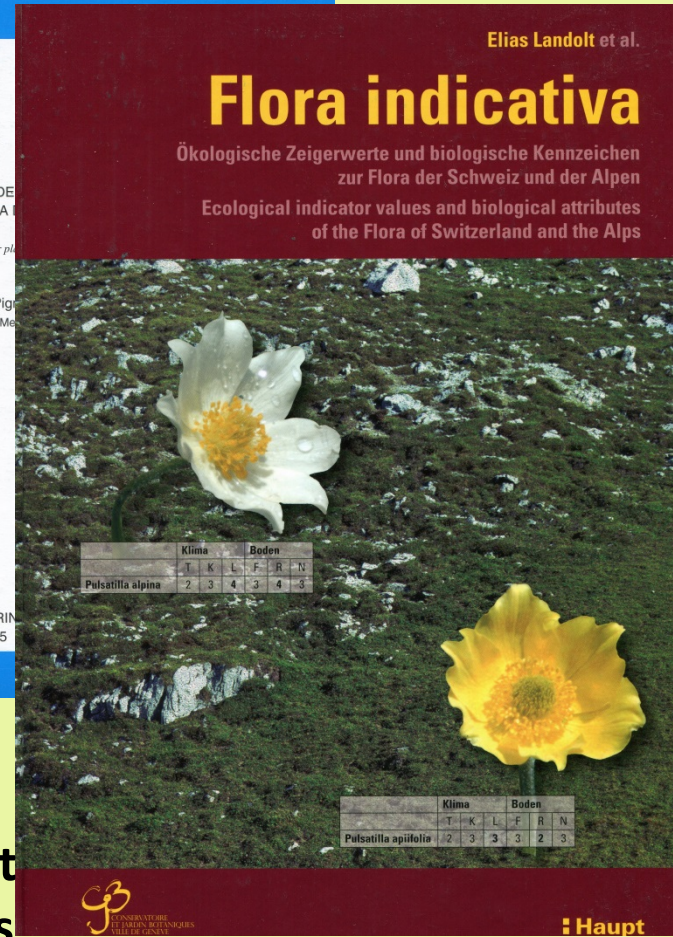
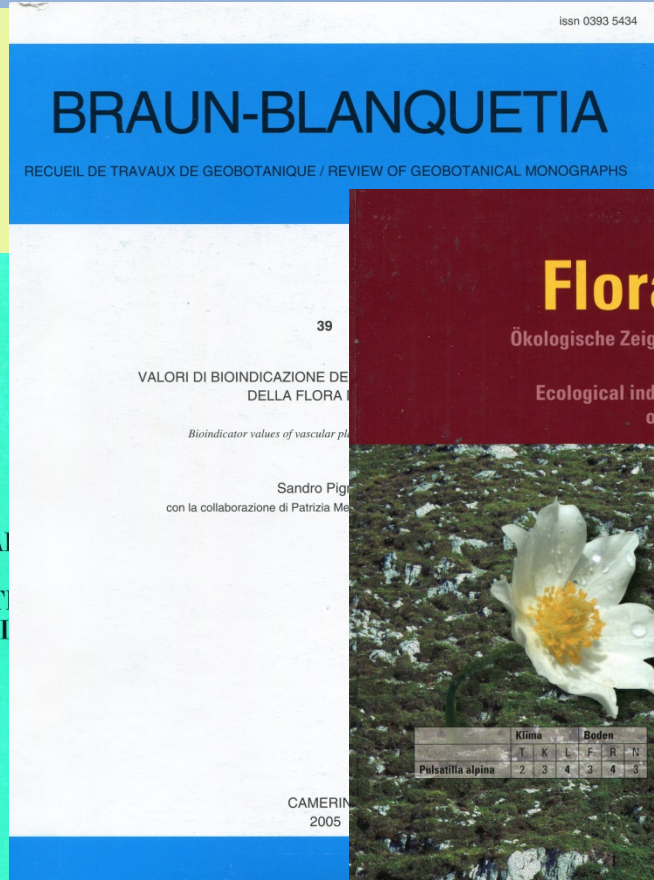
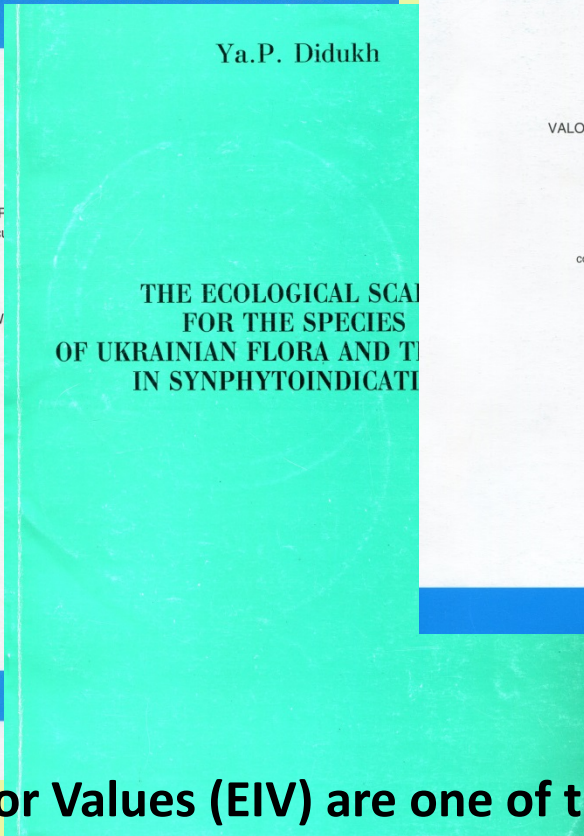
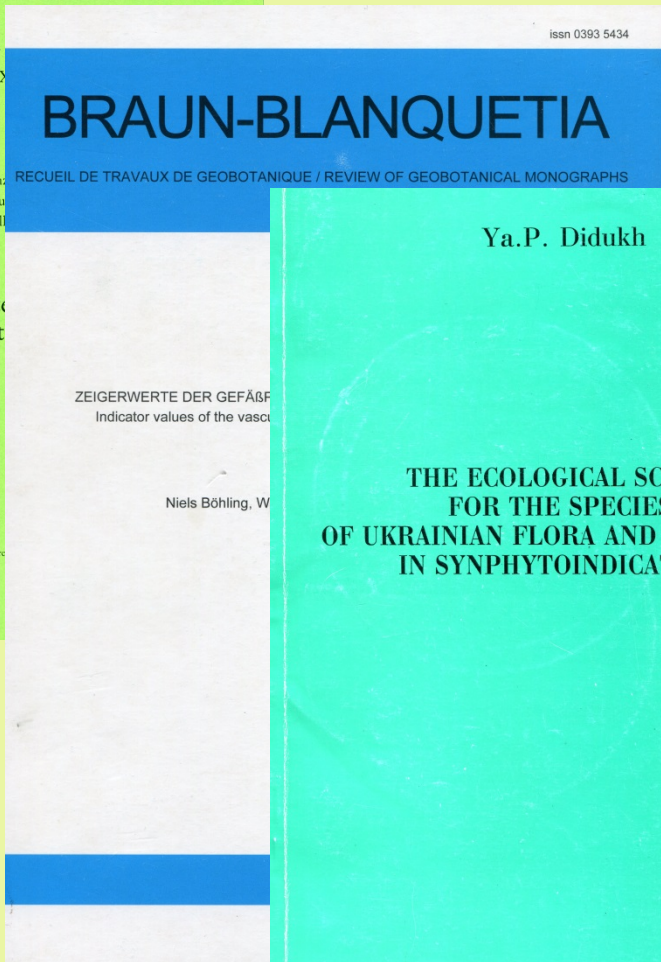
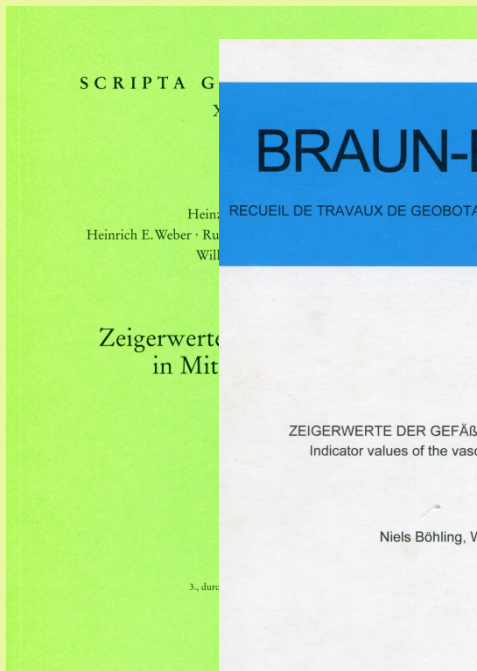




Ecological Indicator Values of Europe (EIVE) 1.0: a powerful open-access tool for vegetation scientists

Jürgen Dengler, Elisabeth Hüllbusch, Claudia Bită-Nicolae, Milan Chytrý, Yakiv P. Didukh, Martin Diekmann, Hartmut Dierschke, Thorsten Englisch, Nikolai Ermakov, Heike Feldhaar, Anna Maria Fosaa, Dieter Frank, François Gillet, Riccardo Guarino, Stephan M. Hennekens, Mark O. Hill, Sven D. Jelaska, Borja Jiménez-Alfaro, Philippe Julve, Zygmunt Kącki, Gerhard Karrer, Michael P. Nobis, Wim A. Ozinga, Sandro Pignatti, Thomas Raus, Marcela Řezníčková, Eszter Ruprecht, Urban Šilc, Manuel J. Steinbauer, Jean-Paul Theurillat, Lubomir Tichý & Florian Jansen



► Ecological Indicator Values (EIV) are one of the most widely used tools of European vegetation ecologists

► Starting with Ramenskyi and Ellenberg, numerous national lists, but none that is applicable at European scale

SCRIPTA G

issn 0393 5434

BRAUN-BLANQUETIA

RECUEIL DE TRAVAUX DE GEOBOTANIQUE / REVIEW OF GEOBOTANICAL MONOGRAPHS

Heinrich E. Weber · Rudolf Will

Ya.P. Didukh

BRAUN-BLANQUETIA

RECUEIL DE TRAVAUX DE GEOBOTANIQUE / REVIEW OF GEOBOTANICAL MONOGRAPHS

39

VALORI DI BIOINDICAZIONE DELLA FLORA

Bioindicator values of vascular plants

Sandro Pignatelli
con la collaborazione di Patrizia Mercuri

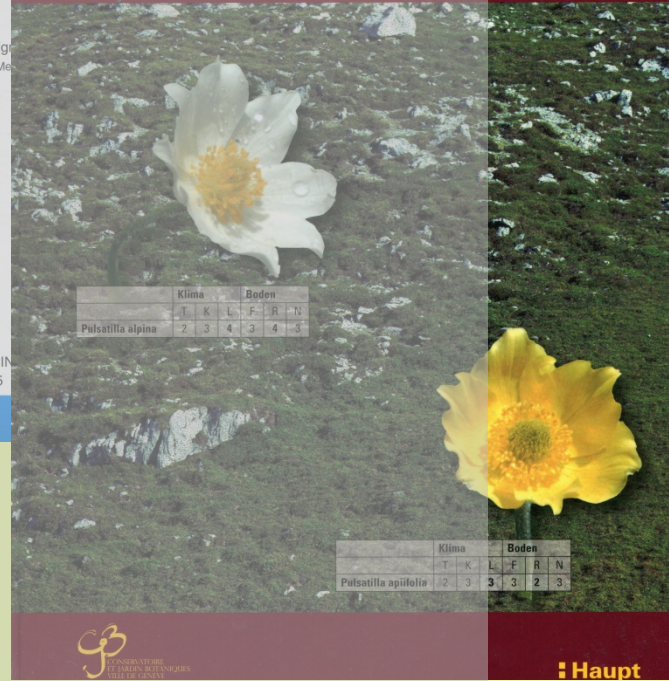
CAMERINO
2005

issn 0393 5434

Elias Landolt et al.

Flora indicativa

Ökologische Zeigerwerte und biologische Kennzeichen zur Flora der Schweiz und der Alpen
Ecological indicator values and biological attributes of the Flora of Switzerland and the Alps



Zeigerwert
in Mi

Presentation today

- Idea of EIVE and data sources
- F-value as an example
- Problems to be solved
- EIVE 1.0
- Potential of EIVE
- Future releases of EIVE

ZEIGERWERTE DER GEFÄßPFLANZEN
Indicator values of the vascular plants

Niels Böhring, W

THE ECOLOGICAL SCALE
FOR THE SPECIES
OF UKRAINIAN FLORA AND THE
INDICATOR VALUES

Idea of EIVE and data sources

- ▶ **A single indicator value system for all European (vascular) plants with uniform scales**
- ▶ **EIVE Database now comprises 29 individual EIV systems**
(+ 2 more in preparation to be provided soon)
 - Some for whole countries, others for smaller regions
 - Some for all (vascular) plants, others only for forests or grasslands
 - Some with the „traditional“ Ellenberg parameters (F = moisture, R = reaction, N = nitrogen, T = temperature, K = continentality, L = light), others with various other/additional parameters
- ▶ **Approx. 22,000 taxon names and 25 parameters**
- ▶ **Main problems for establishment of a European system**
 - Plant taxonomy/nomenclature (synonyms, different concepts,...)
 - Scales vary widely among the EIV systems



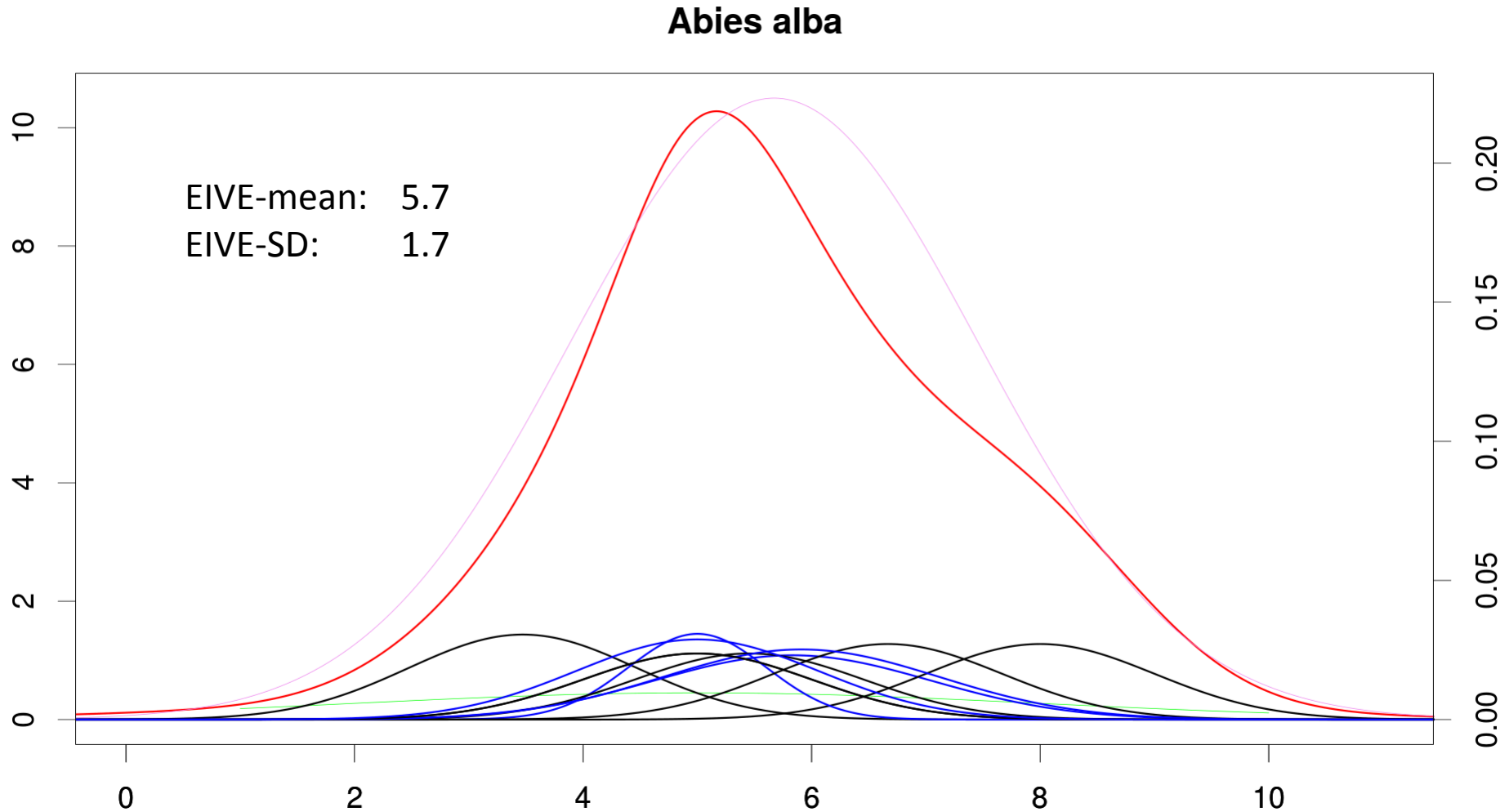
The F-value (moisture) as an example

- ▶ **26 EIV systems contain F-values or something equivalent**
- ▶ **Scales:**
 - 1-5 (5x), 1-6 (3x), 1-7 (1x), 1-9 (2x), 1-12 (10x), 1-23 (2x), 1-120 (1x)
 - 0-11 (1x), 0-12 (1x)
- ▶ **Variance information:**
 - none (9x)
 - 2 levels (7x)
 - 3 levels (4x)
 - range (6x)
- ▶ **F11 = F12?**
 - F11 and F12 (or F6 and F7) in many lists refer to the same ecological conditions, just to different growth forms

The F-value (moisture): steps of data processing

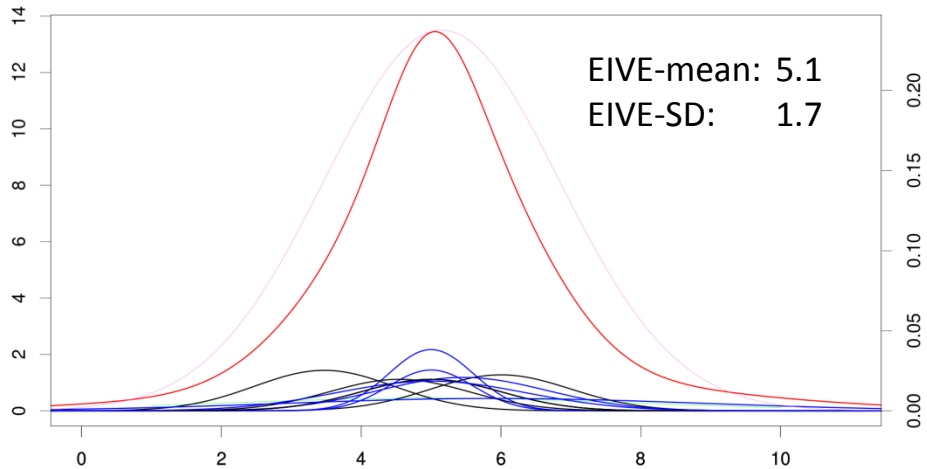
1. **Combine two highest levels if they mean the same**
2. **Rescale the national F-values (means/optima) to a continuous 0-10 scale**
 - ▶ linear transformation
 - ▶ optimum for x-values set to the mean of the national EIV system
3. **Transform the national variance information to the same scale (EIV-SD)**
 - I (normal values): SD = 1
 - II (small letters): SD = 2
 - x: SD = 3
 - range: SD = 1/3 of the range after rescaling
4. **Sum density curves of national normal distributions to a European total**
 - ▶ territories weighted by \log_{10} -transformed area
(Faroeer = 1.0, European Russia = 4.4)
5. **Derive European optimum and SD**
 - ▶ fitting a normal distribution to the irregular distribution curve

The F-value (moisture): *Abies alba*

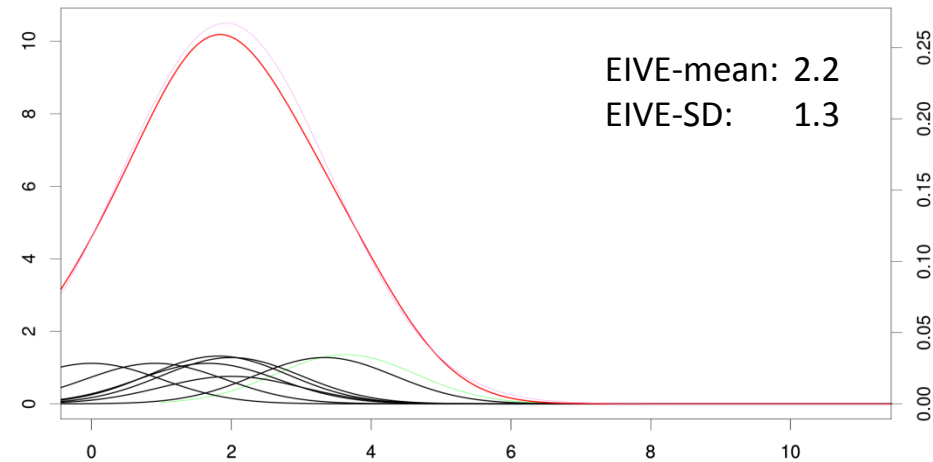


The F-value (moisture): other examples

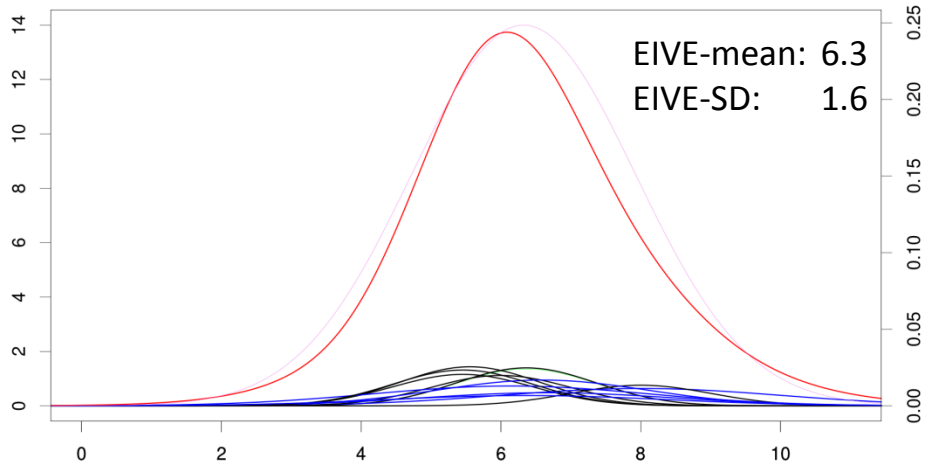
Acer platanoides



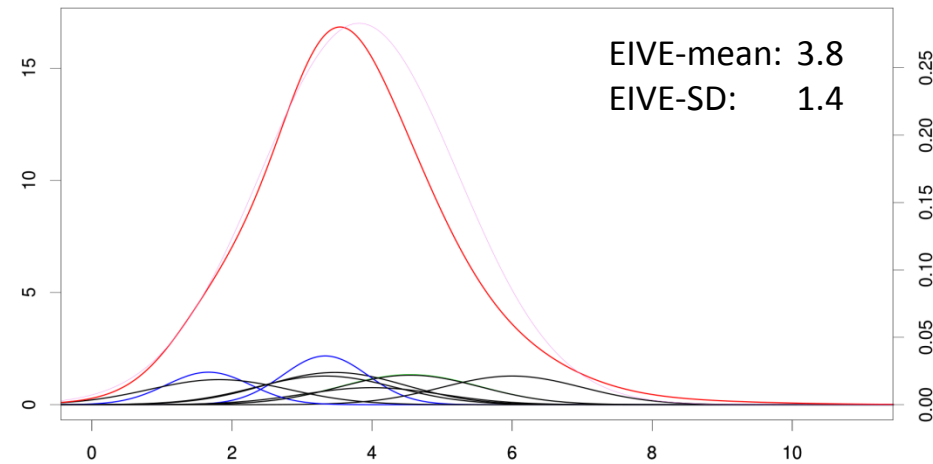
Aethionema saxatile



Agrostis stolonifera

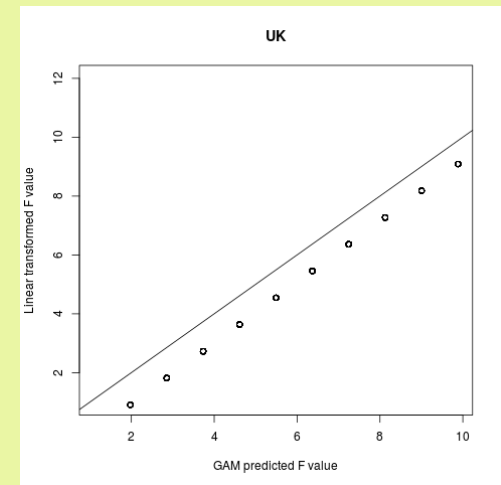
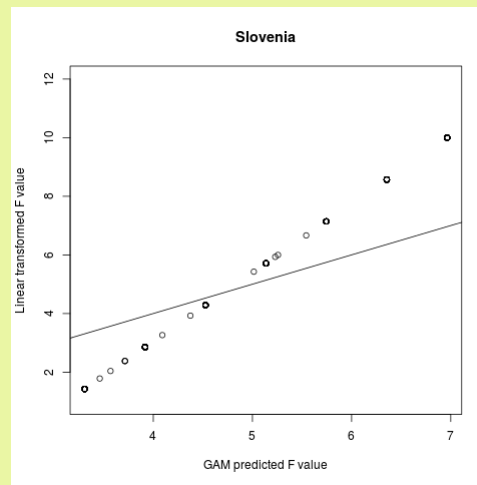
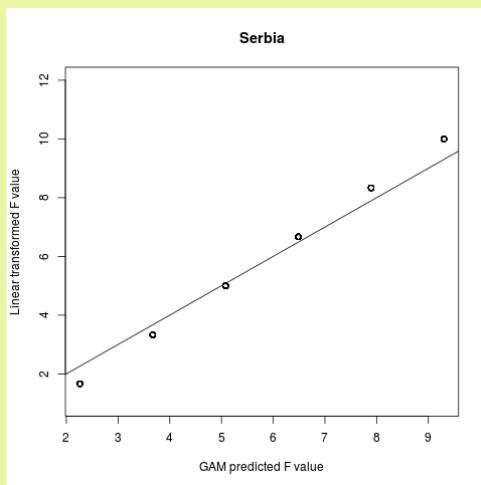


Astragalus australis



The F-value (moisture): remaining problems

1. Simple linear rescaling of national EIV values to EIVE scale not appropriate in all cases



2. Check for outliers (i.e. extreme differences in rescaled optima)
3. Implement EuroSL (see poster of Jansen et al. today No. 54)
 - ▶ Match synonyms and other corresponding names
 - ▶ Use taxonomic hierarchy

Outline of EIVE 1.0

- **„Consensus list“ of all available national EIV systems**
(with no attempt to improve the assessments)
- **Only vascular plants**
- **Core set of parameters that are particularly important and well covered:**
at least F, R and N
- **All EIVE parameters with optimum (scaled to 0–10) and SD**
- **Additionally: provision of all national parameters matched to EuroSL**
except those national lists where copyright does not allow re-publication
- **Publication as open access database in the course of 2016**
accompanied by a planned database paper in *Applied Vegetation Science*
- **Full integration intended into:**
 - *JUICE*
 - *EVA*
 - *SynBioSys Europe*

Options of EIVE 1.0

- **Efficient and consistent biodindication in multinational projects or in regions without national EIV system**
 - including the option to use the variance information
- **Testing ecological theories**
 - shift of ecological optima along biogeographic gradients
 - niche widths vs. location within species' ranges or species functional traits
 - [...]

Visions for future releases of EIVE

EIVE will be published in compatible versions, allowing for the successive improvement and expansion of its content, e.g.

- **Bryophytes, lichens and macro-algae**
- **Further parameters**
- **Expansion to all taxa occurring in Europe:**
 - using co-occurrence data from EVA
- **Additional regional releases:**
 - using co-occurrence data from EVA
- **Improvement of the expert assessments in EIVE by:**
 - co-occurrence data from EVA
 - using plots with measured environmental data from EVA (e.g. pH)
- [...]

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XVIII

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Thank you for your attention and looking forward to your suggestions and input!

THE ECOLOGICAL SCIENCE
FOR THE SPECIES

Niels Böhring, Werner

CAMERINO
2005

	Klima			Boden		
	T	K	L	F	R	N
<i>Pulsatilla alpina</i>	2	3	4	3	4	5

	Klima			Boden		
	T	K	L	F	R	N
<i>Pulsatilla apiifolia</i>	2	3	3	3	2	3